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Recent Product Assessments and User Readiness Activities at NASA/SPoRT

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Mission

NASA's Short-term Prediction, Research, and Transition (SPoRT) Program is funded by NOAA's JPSS and GOES-R Programs as well as the NASA's Earth Science Office to prepare operational users for new or near-future products from both polar-orbiting and geostationary satellites. NASA/SPoRT provides users the training and technical capabilities to apply NOAA & NASA products to their needs (i.e. Research to Operations) and then collaborates with the user to assess the product impact in a real-world environment for feedback to product developers (i.e. Operations to Research) and to benefit their own peers.

Method

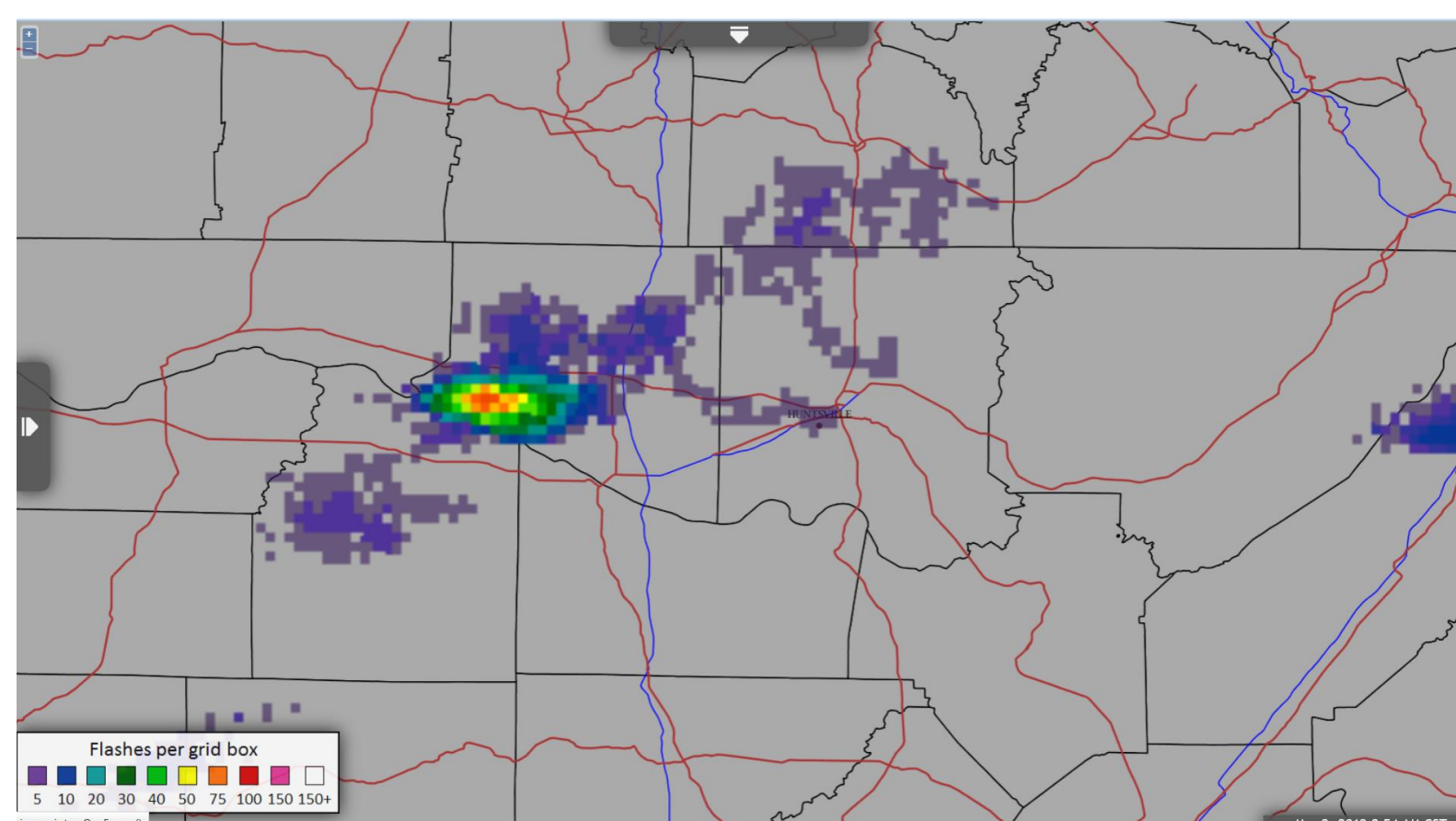
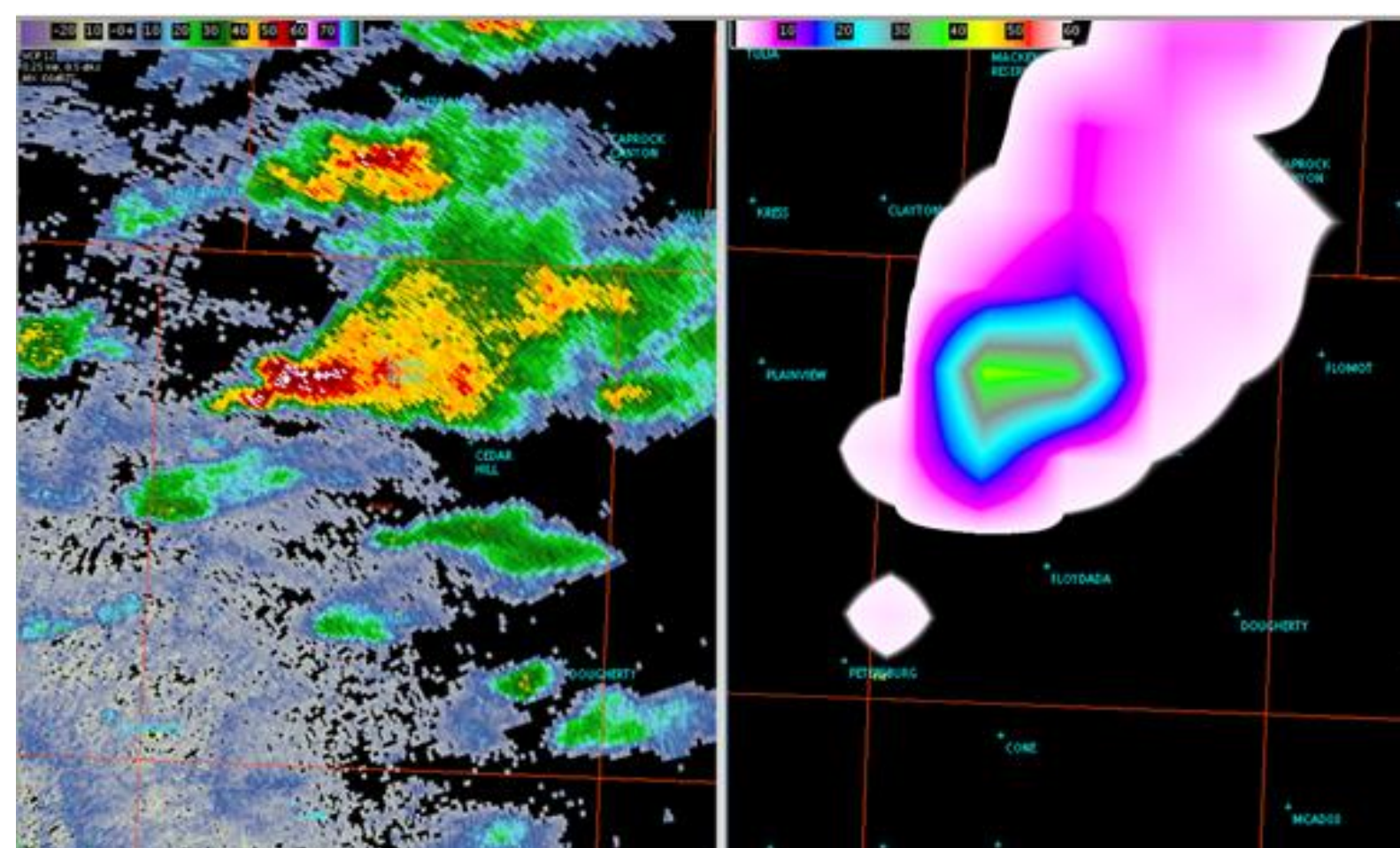
NASA/SPoRT works directly with operational forecasters at NWS Weather Forecast Offices, River Forecast Centers, National Centers, as well as the broad weather community (e.g. Emergency Management Offices) to prepare users for new and upcoming instruments on platforms such as GOES-R, Himawari, JPSS, IceSat2, and GPM. Current instruments such as VIIRS, MODIS, AVHRR, CrIS, and ATMS are used as proxies to demonstrate future capabilities.

Metrics

Assessments are conducted test the application of current products in operations and to ready both the future products and the users for day-1 utility of new capabilities. Results from these assessments have led to improved understanding of the products and instrument capabilities as well as improvements in the products and forecast/nowcast methodologies. Several publications have occurred detailing the use of current instruments as proxies to GOES-R products (i.e. Total Lightning, Air Mass RGB Imagery) with several others in press (Dust and Nighttime Microphysics RGB Imagery). Impacts of specific capabilities and their assessment are summarized below.

Total Lightning: Severe Storms, Public Safety

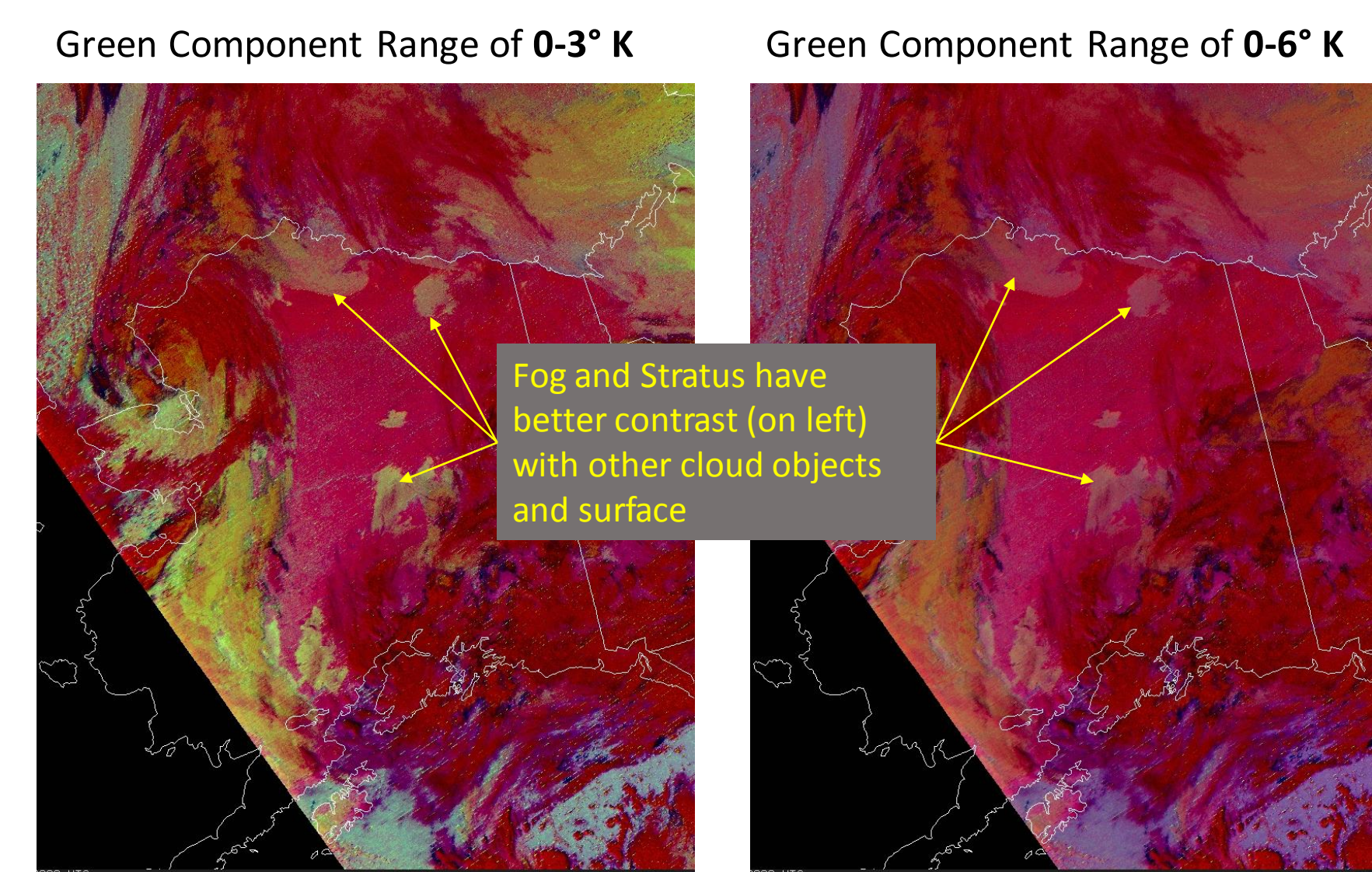
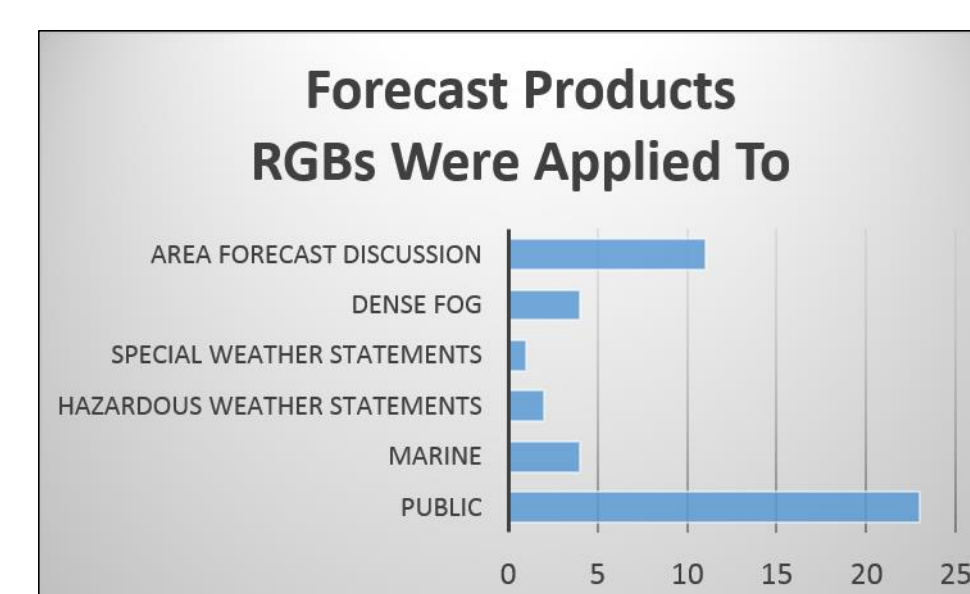
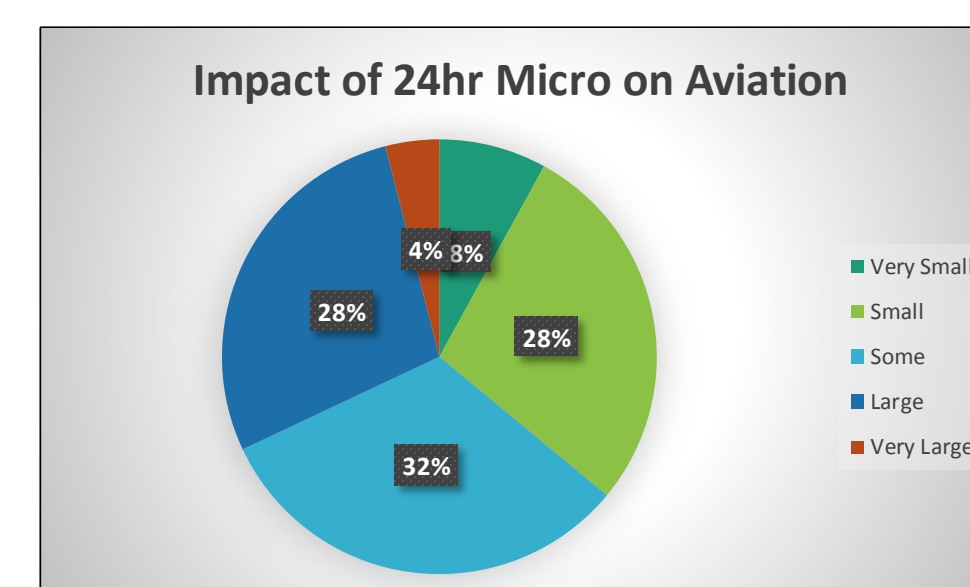
- SPoRT has led the effort to transition total lightning to the end user community
- Emphasis on GOES-R preparations with the PGLM at the Hazardous Weather Testbed
- *"Flash extent density provides insight to storm development aiding with severe weather warnings."*
- Through a new web display, evaluations with the emergency management community (WFO Morristown and Chattanooga/Hamilton County, Tennessee) are underway.
- *"This product has been extremely helpful in lightning safety situations. These data were used to help decision makers ultimately postpone a U.S. Women's soccer match."*



Multi-spectral Imagery (i.e. RGBs): Low Clouds, Fog

2015 Summer Assessment by High Latitude Forecasters

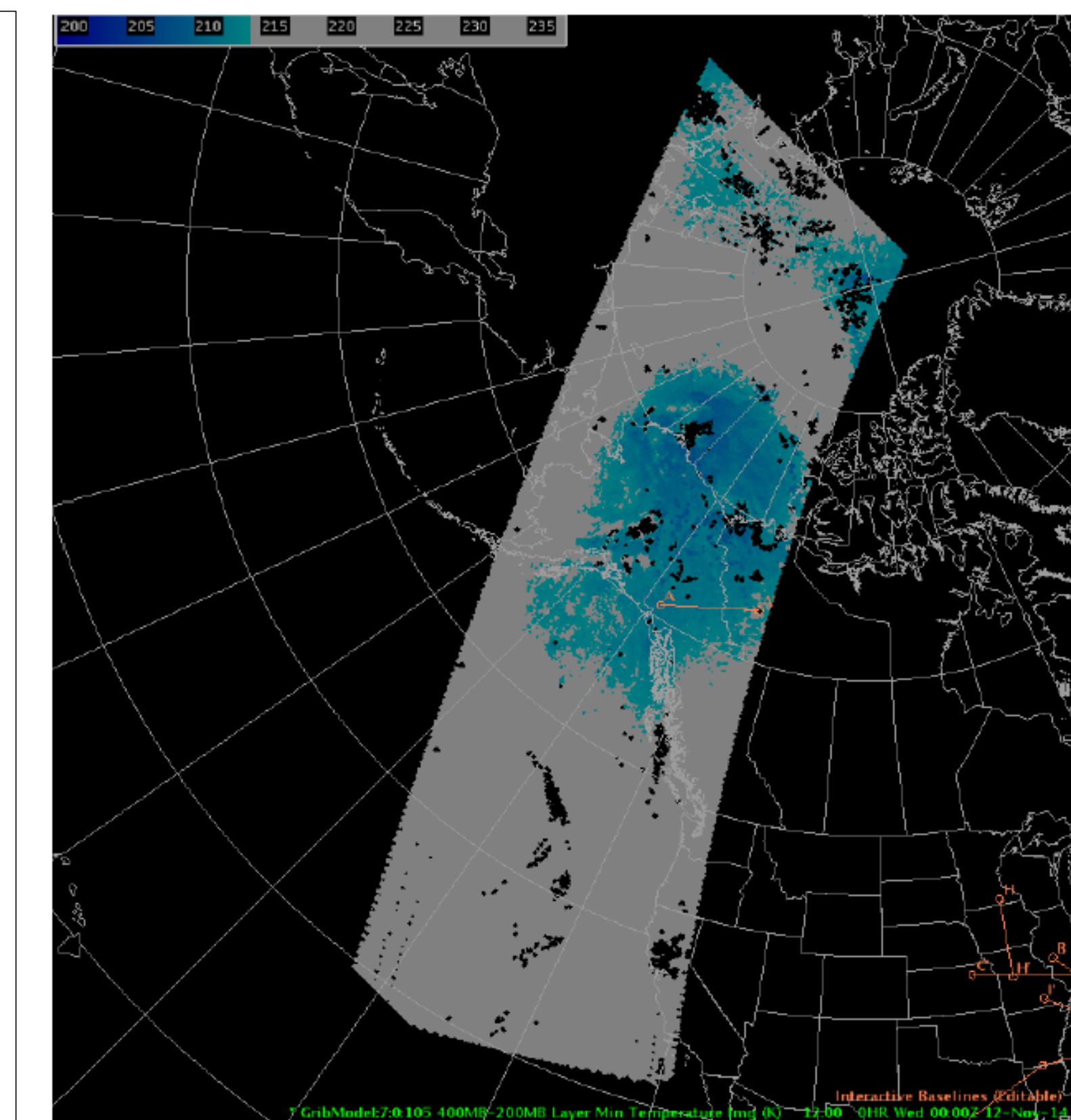
- Large amount of daytime, therefore NtMicro RGB less frequently useable.
- Objective: Can 24-hr Micro RGB fill the need in summer?
 - Both Public and TAF forecasts were impacted frequently, with occasional impact to Marine
 - The RGBs were complementary to other products such as the IFR/LIFR Probability product



24-hour Microphysics RGB Imagery being made available from MODIS, VIIRS, and AVHRR

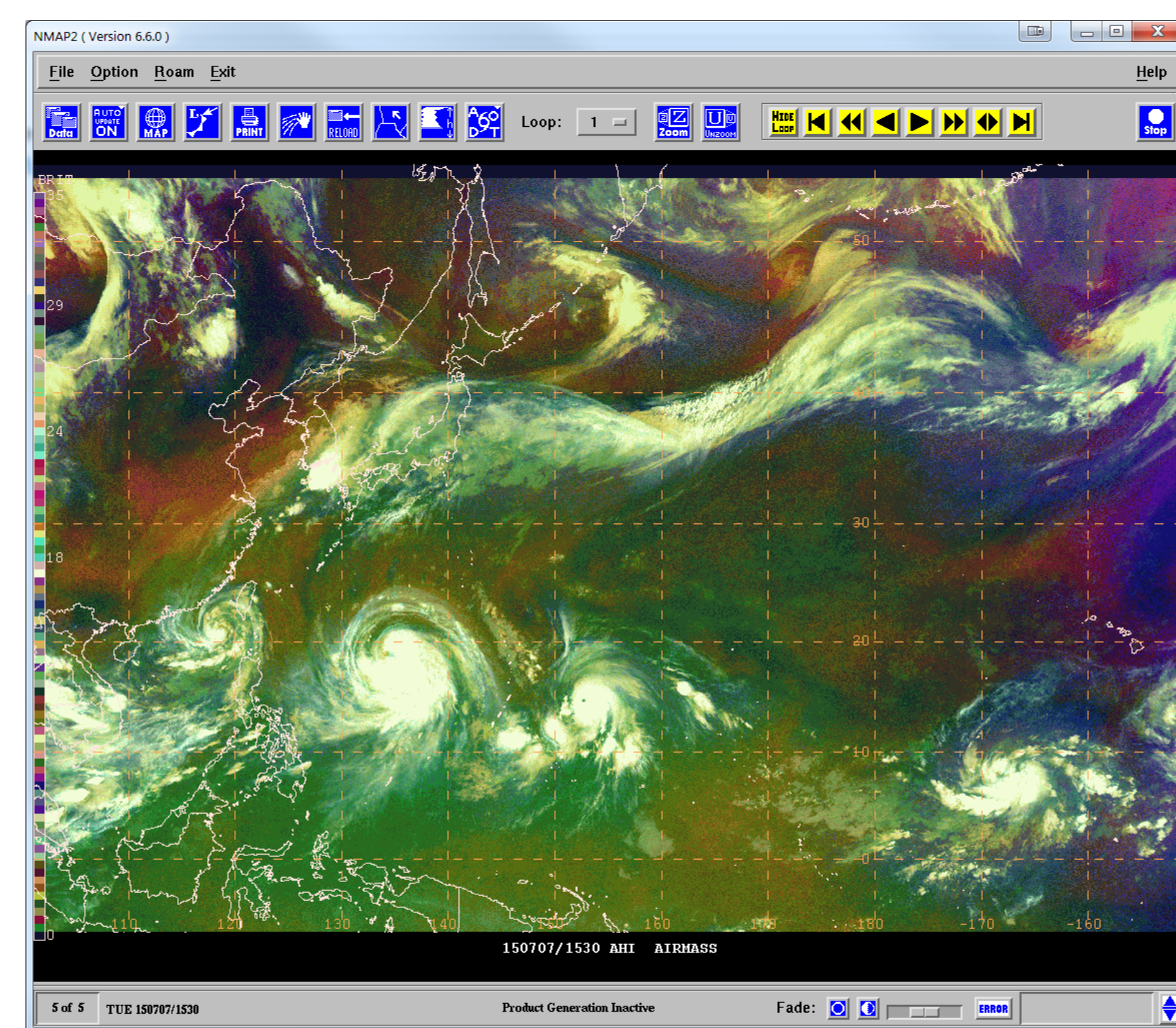
Cold Air Aloft via NUCAPS Soundings

- Cold Air Aloft (CAA; -65C and colder) is potentially hazardous to aircraft due to the threat of fuel crystalizing or freezing.
- The Anchorage, AK Center Weather Service Unit (CWSU) provides Meteorological Impact Statements to Air Traffic Controllers to direct flights around CAA regions.
- In data-sparse Alaska, forecasters traditionally rely on analysis/model fields, limited radiosonde observations, and pilot reports to 'guess' the full extent of the CAA.
- The Cross-track Infrared Sounder (CrIS) provides hyperspectral soundings within NUCAPS dataset allow forecasters to observe the 3D extent of CAA in near real-time where conventional observations are very limited.



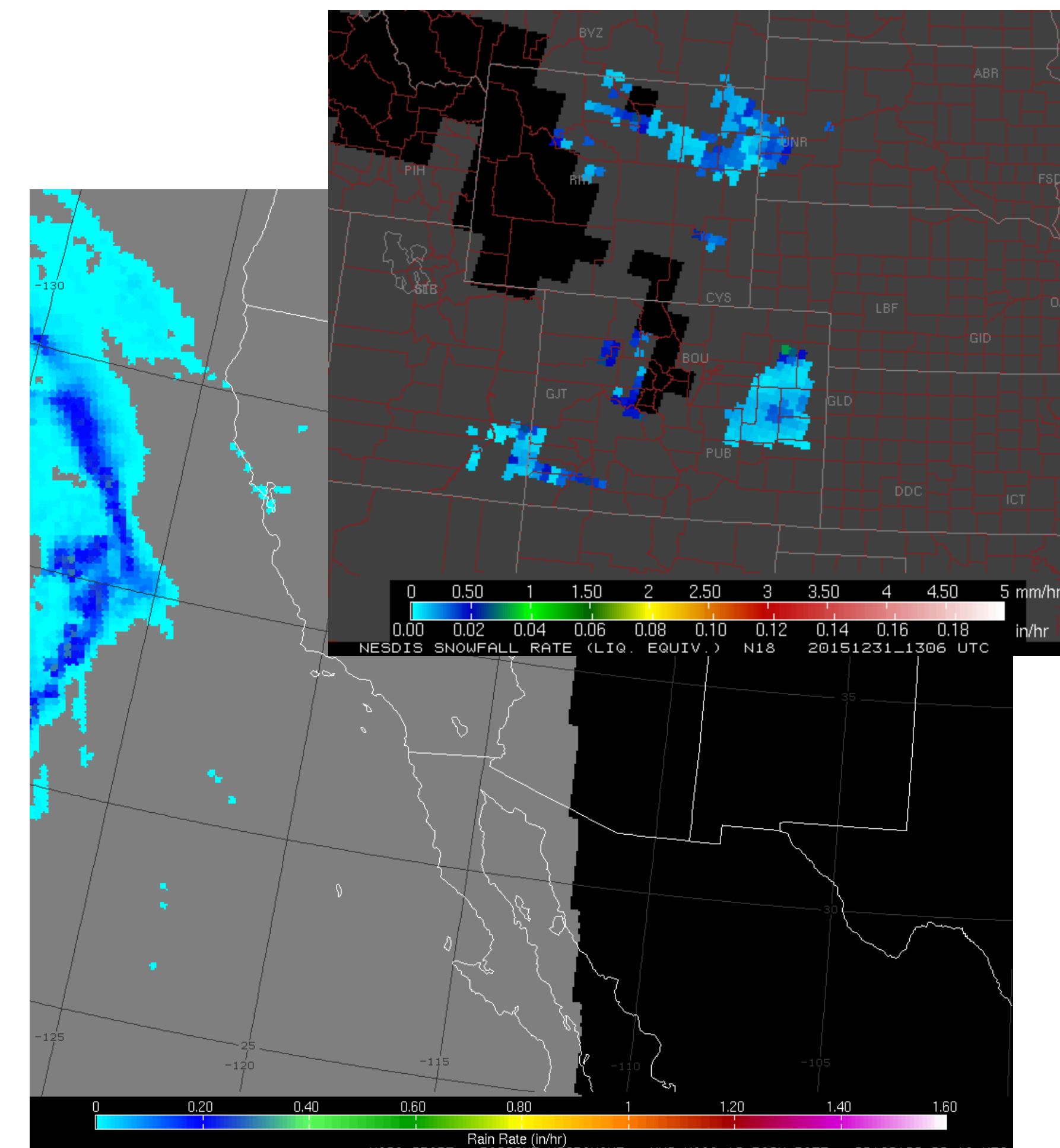
AHI Imagery for National Centers

- The Advanced Himawari Imager is now available within the NAWIPS display system of NWS National Centers via data processing by NASA/SPoRT and is the same as the GOES-R ABI Imagery, sans 1 channel.
- The Ocean Prediction Center (OPC) regularly applies the Air Mass RGB imagery (see right) from AHI to analyze and monitor cyclone development
- Other multi-spectral Imagery being made available by NASA/SPoRT for evaluation by operational users includes: 24-hr Microphysics, Daytime Microphysics, Convective Storms, Dust, Night Microphysics, Natural Color, True Color and Volcanic Ash



Snowfall / Rainfall Rates: JPSS, GOES, and GPM

- NESDIS uses the JPSS/ATMS instrument to detect snowfall within the cloud and allow forecasters to estimate the rate as well as differentiate regions of liquid vs. frozen precipitation
- Rain rates via the GPM intercalibrated dataset allows for a suite of passive microwave instruments to be used to monitor precipitation in data void regions where radar is absent (e.g. upstream of West Coast)



Client-Side Generation of Multi-Spectral Imagery

- NASA/SPoRT leads the Experimental Products Development Team (EPDT) that developed capabilities within AWIPS II to use local channel data (i.e. client-side) to derive RGB Imagery vs. offsite product creation and internet delivery.
- Uses calculated differences as well as specific ranges and data stretching per R-G-B component (i.e. NOT simply a color composite)
- Allows users to sample physical values of RGB

